We Claim:

1. A system for cooling a component with a sprayed cooling fluid, comprising:

a body defining an enclosed spray chamber and a thermal-transmittance wall, wherein the wall defines an internal surface forming a boundary of the spray chamber, and wherein the wall defines an external surface configured to be retained against a portion of the component; and

a sprayer configured to spray the cooling fluid onto the internal surface.

2. The system of claim 1, wherein the sprayer is configured to eject incremental amounts of cooling fluid onto the wall in response to a control signal.

3. The system of claim 2, wherein the sprayer is a thermal sprayer.

4. The system of claim 2, and further comprising a controller configured to transmit a control signal to the sprayer such that the sprayer ejects incremental amounts of cooling fluid at a rate leading to the cooling fluid being vaporized by heat dissipated from the component.

5. The system of claim 1, wherein the body further defines a reservoir configured to receive the sprayed cooling fluid from the internal surface, and configured to feed the received cooling fluid to an inlet of the sprayer.

6. The system of claim 1, wherein the body further defines a condenser configured to remove heat from cooling fluid vaporized by heat dissipated from the component.

7. The system of claim 6, and further comprising a pump configured to pump cooling fluid from the spray chamber.

8. The system of claim 7, wherein the pump comprises:

a member defining one or more cavities forming a porous passageway extending upward with respect to gravity, toward the sprayer;

wherein the porous passageway is configured such that cooling fluid surface-tension forces will draw the cooling fluid upward toward the sprayer.

9. The system of claim 7, wherein the pump comprises a means for drawing cooling fluid upward toward the sprayer under the effect of surface-tension forces.

10. The system of claim 7, wherein the pump comprises a heater configured to heat a surface of the spray chamber.

11. The system of claim 6, and further comprising an apparatus for cooling and transferring vaporized cooling fluid from the spray chamber to the sprayer, comprising:

a condenser configured to receive and cool vaporized cooling fluid;

a reservoir in fluid communication with the condenser such that vaporized cooling fluid that is condensed by the condenser passes into the reservoir, wherein the reservoir is configured to feed liquid cooling fluid to the sprayer; and

a structure defining an open passageway extending from the spray chamber to the condenser.

12. The system of claim 11, and further comprising a heater configured to heat a surface of the spray chamber.

13. The system of claim 11, and further comprising:

a heater configured to heat a surface of the spray chamber;

a temperature sensor configured to sense the temperature of the surface of the spray chamber; and

a controller configured to energize the heater in response to the sensed temperature so as to heat the surface to a predetermined temperature.

14. The system of claim 1, and further comprising:

a thermal-inkjet-type head incorporating the sprayer, wherein the sprayer is configured to eject incremental amounts of the cooling fluid through the spray chamber and onto the wall; and

a pump configured to pump cooling fluid from the spray chamber to a reservoir defined by the body, the reservoir being configured with an outlet to feed cooling fluid to the thermal-inkjet-type head;

wherein the body further defines a condenser configured to remove heat from cooling fluid that was heated by the component.

15. The system of claim 14, wherein the condenser is integral with the reservoir.

16. The system of claim 14, wherein the pump is configured to pump liquid cooling fluid.

17. The system of claim 14, wherein the body is an integral unit.

18. The system of claim 1, wherein the chamber is at least partially evacuated of extraneous gasses.

19. A cooled component, comprising:

a semiconductor device;

a substrate carrying the semiconductor device;

a body defining a spray chamber;

a thermal-transmittance wall, wherein the wall defines an internal surface forming a boundary of the spray chamber, and wherein the wall defines an external surface adjoining a portion of the semiconductor device;

a cooling fluid; and

a sprayer configured to spray the cooling fluid onto the internal surface.

20. The cooled component of claim 19, wherein the sprayer is configured to eject incremental amounts of cooling fluid into thermal communication with the semiconductor device in response to a control signal.

21. The cooled component of claim 20, wherein the sprayer is incorporated in a thermal-inkjet-type head.

22. The cooled component of claim 20, and further comprising a controller configured to transmit a control signal to the sprayer such that the sprayer ejects cooling fluid at a rate appropriate for vaporizing the cooling fluid while providing adequate cooling to the semiconductor device.

23. The cooled component of claim 19, wherein the body defines a reservoir configured to receive the sprayed cooling fluid from the internal surface, and configured to feed cooling fluid to an inlet of the sprayer

24. The cooled component of claim 19, wherein the body defines a condenser configured to remove heat from cooling fluid vaporized by heat from the semiconductor device.

25. The cooled component of claim 24, and further comprising a pump configured to pump cooling fluid from the spray chamber.

26. The cooled component of claim 19, and further comprising:

a thermal-inkjet-type head incorporating the sprayer; and

a pump configured to pump cooling fluid from the spray chamber to a condenser defined by the body, the condenser being configured to remove heat from cooling fluid vaporized by heat from the semiconductor device;

wherein the body further defines a reservoir configured to receive the sprayed cooling fluid, and configured to feed cooling fluid to an inlet of the sprayer.

27. A circuit board system, comprising

a circuit board; and

a plurality of cooled components as recited in claim 19, each cooled component being mounted on the circuit board.

28. The system of claim 27, each cooled component further comprising:

a pump configured to pump cooling fluid from the internal surface to a condenser defined by the body of the cooled component, the condenser being configured to remove heat from cooling fluid vaporized by heat from the semiconductor device of the cooled component;

wherein the sprayer of each cooled component is a thermal sprayer configured to eject incremental amounts of cooling fluid onto the semiconductor; and

wherein the body of each cooled component defines a reservoir configured to receive cooling fluid from the internal surface, and further configured to feed cooling fluid to an inlet of the sprayer of each cooled component.

29. A circuit board system, comprising:

a plurality of circuit boards; and

a plurality of the cooled components of claim 19, the plurality of cooled components being mounted on the plurality of circuit boards;

wherein the plurality of cooled components is electrically interconnected via the plurality of circuit boards.

30. The circuit board system of claim 29, each cooled component further comprising:

a pump configured to pump cooling fluid from the internal surface to a condenser defined by the body, the condenser being configured to remove heat from cooling fluid vaporized by heat from the semiconductor device;

wherein the sprayer of each cooled component is a thermal sprayer configured to eject incremental amounts of cooling fluid onto the semiconductor; and

wherein the body of each cooled component defines a reservoir configured to receive cooling fluid from the internal surface, and further configured to feed cooling fluid to an inlet of the sprayer of each cooled component.

31. A method for cooling a component with a sprayed cooling fluid, comprising:

adjoining an external surface of a body against a portion of the component, the body defining an enclosed spray chamber and a thermal-transmittance wall, wherein the wall defines an internal surface forming a boundary of the spray chamber, and wherein the wall defines the external surface that is retained against the portion of the component; and

spraying cooling fluid onto the internal surface of the wall.

32. The method of claim 31, wherein the step of spraying comprises:

signaling a sprayer to eject incremental amounts of cooling fluid onto the internal surface of the wall at a given frequency.

33. The method of claim 32, wherein:

the sprayer comprises a body defining an ejection chamber configured to hold a volume of the cooling fluid, the body further defining an orifice in communication with the ejection chamber, and the sprayer further comprises a heating element in thermal communication with the ejection chamber, the heating element being configured to vaporize a portion of the cooling fluid held within the ejection chamber, and the orifice being configured to direct cooling fluid from the ejection chamber to the heat source upon the heating element vaporizing a portion of the cooling fluid held within the ejection chamber; and

in the step of spraying, the heating element vaporizes a portion of the cooling fluid held within the ejection chamber in response to the sprayer being signaled, thereby causing cooling fluid to be directed from the ejection chamber to the semiconductor device.

34. The method of claim 31, wherein the body defines a reservoir configured to receive cooling fluid sprayed on the internal surface, and configured to feed the sprayed cooling fluid to a sprayer that is used in the step of spraying, and further comprising pumping the cooling fluid such that it flows from the spray chamber to the reservoir.